

A System for Myocardium Work Determination

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Abstract - The paper shows a method which makes use of a complex equipment for non-invasive determination of myocardium work. The study of the recorded signals leads to useful medical observation of the cardiac activities. One can anticipate if a myocardium accident can be expected.

In medical research an important role in therapeutics and prophylaxy is played by the way in which the myocardium work is evaluated. There is a wide range of working techniques, but most of them are invasive (catheterisation, angiography with contrast matter, myocardium scintigraphy, etc). Myocardium work estimation can be performed on the basis of electrocardiographic, phonocardiographic or echocardiographic examinations but their accuracy is generally quite low. A method for the noise spectrum in the heart valves was also developed and this was mainly used for watching valve implants. Its principle is an algorithym based on a Fast Fourier Transform.

The present paper shows our simple method which makes use of a complex equipment for the non-invasive determination of myocardium work. We used a microphone type transducer which enables a selective investigation from both the surface and special myocardium area point of view. The analog signal from the transducer is filtered, amplified and after the digital/analog conversion it is applied on a microcomputer. The study of the

recorded signals (electrocardio - gram, phonocardiogram, spectrophonocardiogram) leads to useful medical observations of the cardiac activities. From the graphical representation of the sonorous level along a pulse, one can compute the auricular and ventricular myocardium work. The spectrophonocardiogram signal is transposed in frequency sonorous power coordinates (Hz-dB) and the computing program is thus conceived as to enable the determination of the maximum, minimum, total, average, ventricular and auricular work. The test carried out in a clinic made us statistically and graphically plot the time-dependent work variation. By means of this diagram one can anticipate if a myocardium accident can be expected.

The method permits an "in vivo" study of the work performed by the myocardium as well as any long term investigation, ensuring a selectivity of the desired pulse through the implemented computing program. The research performed proved that the present method is more accurate for the fast evaluation of the myocardium work than many other procedures.

References

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